OPERATIONS DEMONSTRATION PLAN

for the

Radar Product Central Collection/Distribution Service (RPCCDS)

Revision 1

June 2000

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service/Office of Systems Operations
Systems Integration Division/Field Systems Branch

Executive Summary

This document describes the plan the National Weather Service (NWS) will follow in conducting an operations demonstration of the Radar Product Central Collection/Distribution Service (RPCCDS). The RPCCDS will replace the Next Generation Radar (NEXRAD) Information Dissemination Service (NIDS). The plan includes information about the demonstration participants, key NWS personnel involved in the project, and the methodology for conducting the demonstration and reporting the results.

The purpose of the demonstration is to provide measurements and analysis of system performance and related information for use in determining the operational effectiveness and suitability of the RPCCDS in meeting the needs of its users for timely and reliable access to WSR-88D products. The results of the demonstration will be used, along with other factors, by NWS management to determine whether the RPCCDS can be certified for operational use, thereby replacing the NIDS.

The demonstration will include all interested users connected to the RPCCDS. The demonstration participants will include the NCEP, one of the NIDS providers, and at least one non-Government user, if available.

The NWS Field Systems Branch (FSB) will conduct the demonstration for a continuous 30-day period. The FSB-developed Product Availability Monitoring System (PAMS) software will be used to collect and analyze RPCCDS performance data to support the performance analysis.

Table of Contents

Attachments

Figures

Tables

Acronyms

APO	AWIPS Program Office
AWIPS	Advanced Weather Interactive Processing System
DOD	Department of Defense
FAA	Federal Aviation Administration
FSB	Field Systems Branch
FTP	File Transfer Protocol
GSC	Gateway Server Center
Kbps	Kilobits per second
Mbps	Megabits per second
NCEP	National Centers for Environmental Prediction
NCF	Network Control Facility
NEXRAD	Next Generation Weather Radar
NIDS	NEXRAD Information Dissemination Service
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
NWSEO	NWS Employees Organization
NWSTG	NWS Telecommunication Gateway
OM	Office of Meteorology
OSO	Office of Systems Operations
PAMS	Product Availability Monitoring System
RPCCDS	Radar Product Central Collection/Distribution Service
RPG	Radar Product Generator
UTC	Universal Time Coordinated
WAN	Wide Area Network
WMO	World Meteorological Organization
WSH	Weather Service Headquarters
WSR-88D	Doppler Weather Surveillance Radar

PART I: Demonstration Overview

1. Introduction

The National Weather Service (NWS) plans to collect Doppler Weather Surveillance Radar (WSR-88D) products from all radars in the United States (including Puerto Rico) to make them openly available from the Radar Product Central Collection/Distribution Service (RPCCDS) located in Silver Spring, Maryland. Once the RPCCDS is operational, users of WSR-88D products will be allowed to access those products from the RPCCDS.

When certified for operational use, the RPCCDS will replace the Next Generation Weather Radar (NEXRAD) Information Dissemination Service (NIDS). NIDS provides NWS and other government and non-government users with access to products from WSR-88D radars operated in the United States by the NWS, the Department of Defense (DOD), and the Federal Aviation Administration (FAA).

The NWS will conduct an operations demonstration of the RPCCDS as a prerequisite in the certification process. The results of the demonstration will be used, along with other factors, by NWS management to determine whether the RPCCDS can replace the NIDS. The demonstration is limited to certifying the data flow to support the replacement of the NIDS.

2. Purpose

The purpose of the operations demonstration is to provide measurements of system performance and related information for use by NWS management in determining the operational effectiveness and suitability of the RPCCDS in meeting the needs of its users for *timely* and *reliable* access to WSR-88D products.

3. Objectives

The principal objective of the operations demonstration is to measure the timeliness and reliability of access to WSR-88D products available on the RPCCDS. In conjunction with these measurements, the demonstration will solicit subjective evaluations of timeliness and reliability from selected government and non-government users.

The demonstration will also assess the adequacy of technical documentation provided by the NWS to users of the RPCCDS.

4. Background

The NWS has a validated requirement (see Section 4.2) to centrally collect WSR-88D products to be used for the initialization of numerical models and to support forecast and warning operations (see Attachment 3). To meet this requirement, the NWS is using the Advanced Weather Interactive Processing System (AWIPS) Wide Area Network (WAN) frame relay communication network to deliver radar products from the WSR-88D Radar Product Generator (RPG) systems to the AWIPS sites, then to the Network Control Facility (NCF) in Silver Spring, Maryland by the AWIPS WAN. From the NCF, radar products are forwarded to the radar servers, (including primary and back-up servers, NIDSServA and NIDSServB) and to NOAAPort. (The NOAAPort broadcast system provides a one-way broadcast communication of National Oceanic and Atmospheric Administration (NOAA) environmental data and information in near-real time to NOAA and external users.) Users can access WSR-88D products from either the RPCCDS or from NOAAPort. The NOAAPort portion of the radar product distribution is not a part of this demonstration.

The radar servers are located in the NWS Telecommunications Gateway (NWSTG). They receive the radar products from all the sites and collect them into Unix "tar" files every ten seconds. The radar server sends a message to each client notifying them a "tar" file is ready to send. Each client returns a message indicating it is ready to receive the "tar" file. The radar server then sends the "tar" file to each client (called "multicast"). When the "tar" file is successfully received, the client notifies the radar server.

Figure 1 illustrates the data path for the radar products. There are three methods the radar products will be distributed by the radar server:

1. Multicast "Open Group";
2. Gateway Server Center (GSC) File Transfer Protocol (FTP) Cluster Servers located in the NWSTG; the GSC FTP Cluster Servers is a closed group Multicast client;
3. Multicast "Closed Group."

The radar servers will be managed and maintained by the NWS OSO SOC on a 24 hour by 7 days a week schedule. This includes management of new clients accessing the servers as well as providing technical documentation on the Internet pages.

4.1 RPCCDS Operations Concept

The following sections describe three methods government users of the RPCCDS can use to access WSR-88D products from this service. Non-government users can use only the first two methods. For more information on the operations concept, refer to the "Dissemination of WSR-88D Products Concept Paper," March 27, 2000, available on the Web at http://www.nws.noaa.gov/noaaport/html/whats_nw.shtml.

Radar Product Central Collection/ Distribution Service

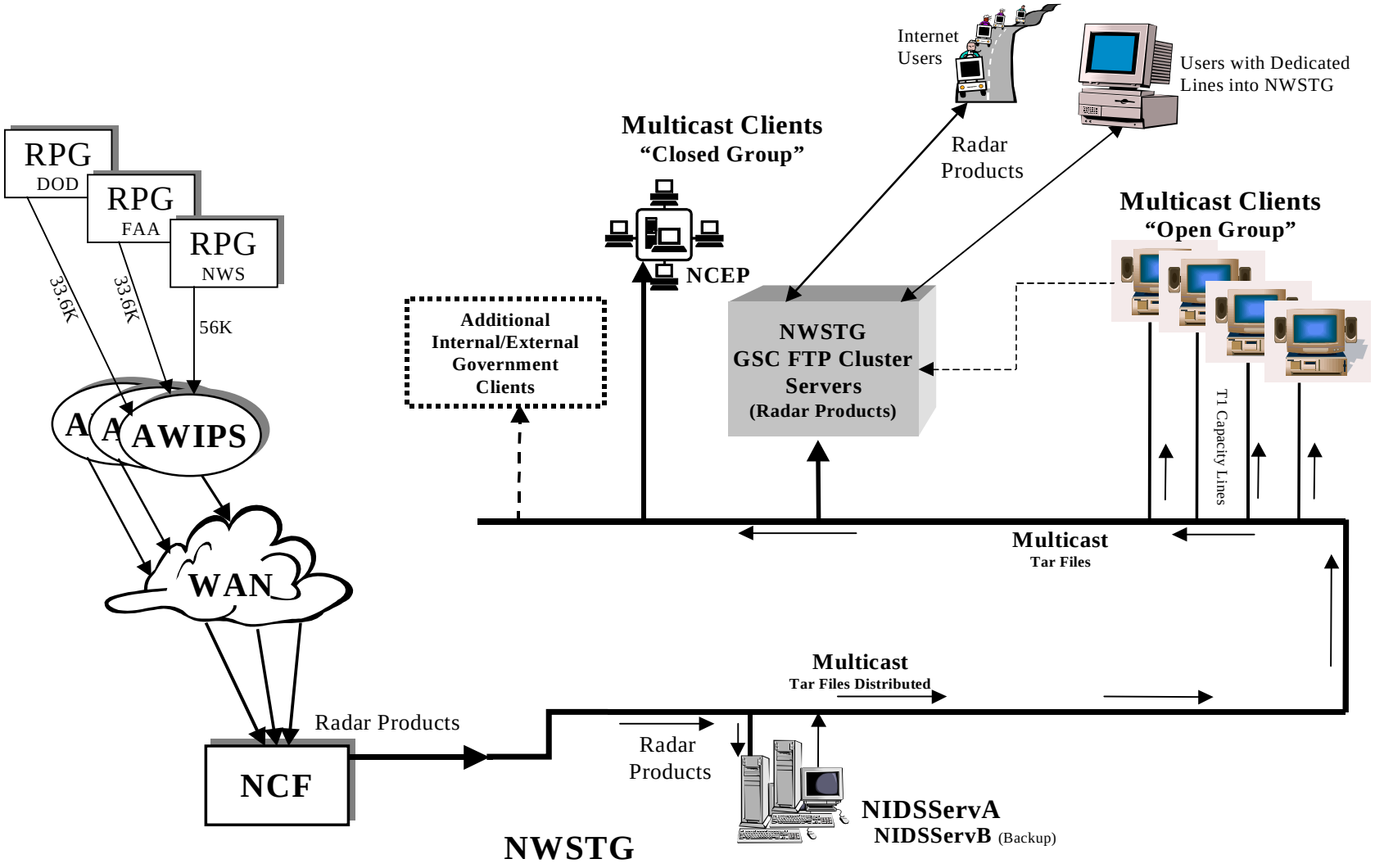

Figure 1. RPCCDS Data Flow

4.1.1 Access Through Multicast "Open Group"

Users can access WSR-88D products from the RPCCDS using Multicast "open group" technology. Multicast "open group" delivery does not require users to be registered on a continuous basis but operates by announcing a product file is available. At that point, any user can respond and receive the product. The Multicast "open group" protocol does not continue attempting to create a link with the receiver, but once the link is established, it verifies delivery of files and allows users to recover erroneous product files or product files that were missed.

Users accessing products through the multicast open group protocol can choose an appropriate hardware configuration from the Multicast Configuration Guide, available on the Web at http://www.nws.noaa.gov/radar.html. Users will also need the Starburst Omnicast software. The Government will provide the licensed Omnicast software.

Users of the Multicast "open group" method will also need a dedicated line to the RPCCDS; the dedicated line must have a minimum (T1) capacity of 1.5 megabits per second (Mbps). Each user has the responsibility to fund, procure, operate, and maintain this dedicated line.

4.1.2 Access Through Anonymous File Transfer Protocol (FTP)

Users can also access WSR-88D products from the RPCCDS using Anonymous FTP technology. Users with FTP delivery systems are not registered with the NWS and delivery of the product files is not verified. The FTP server is located in the NWSTG on the GSC FTP Cluster Servers. The radar products are stored individually in a directory and file structure indicating the product name for retrieval by FTP.

Users accessing products through Anonymous FTP can use any hardware supporting FTP service.

Users of the FTP method can access the radar products through a dedicated communication line to the NWSTG or on the Internet. If users choose the dedicated line method of anonymous FTP access, they have the responsibility to fund, procure, operate, and maintain the dedicated line.

4.1.3 Access Through Multicast "Closed Group"

Selected Government users also have an option to access WSR-88D products from the RPCCDS using Multicast "closed group" technology. Users of Multicast "closed group" delivery are registered and the protocol ensures delivery of the product files and retransmission if required.

Users accessing products through the Multicast "closed group" protocol can choose an appropriate hardware configuration from the Multicast Configuration Guide, available on the Web at http://www.nws.noaa.gov/radar.html . Users also need the Starburst Omnicast software. The Government will provide the licensed Omnicast software.

Users of the Multicast "closed group" method need a dedicated line to the RPCCDS; the dedicated line must have a minimum (T1) capacity of 1.5 Mbps.

Initially, multicast closed group access will be available only to Federal Government users with 24 hours a day/7 days a week (24/7) operations monitoring. In the future, this type of access will be evaluated to determine the feasibility of making it available to additional external users.

4.2 Change Requirement

The requirement for the NWS to collect WSR-88D products centrally is established by an NWS Operational Requirement Document, "Centralized Use of Weather Radar Data by the NWS's National Centers for Environmental Prediction (NCEP)," approved by NOAA's Assistant Administrator for Weather Services on July 6, 1998.

5. Demonstration Management

5.1 NWS Roles and Responsibilities

This section describes the roles and responsibilities of the NWS in the oversight and management of the demonstration. The Office of Systems Operations' (OSO) Field Systems Branch (FSB) has overall responsibility for the RPCCDS demonstration. Names and phone numbers of individuals are included in Attachment 2, RPCCDS Demonstration Oversight Group.

Demonstration Director - Has overall responsibility for organizing and managing the NWS personnel supporting the demonstration. Documents the NWS involvement in the demonstration in a formal operations demonstration plan. Manages the day-to-day demonstration data collection. Documents the results in the operations demonstration report and provides briefings as required.

Demonstration Team Staff - Coordinate demonstration activities. Complete modifications of FSB's Product Availability Monitoring System (PAMS) required to collect and analyze RPCCDS data. Operate PAMS during the demonstration. Collect and analyze the demonstration PAMS data. Provide periodic summary reports to the Demonstration Director, as required. Support the Demonstration Director in writing the operations demonstration report.

RPCCDS Program Management Staff - Reviews drafts of the RPCCDS demonstration plan and final report. Participates in the demonstration as an RPCCDS technical resource.

5.1.1 RPCCDS Demonstration Oversight Group

The RPCCDS Demonstration Oversight Group will be chaired by the Demonstration Director and comprised of the RPCCDS Program Manager and representatives of the Office of Meteorology (OM), the AWIPS Program Office (APO), the OSO, the NCEP, and other demonstration participants. The contractor, GMSI, will serve as a technical advisor to the group. Members of the group are identified in Attachment 2.

This group will review the demonstration activities and problems and discuss them during weekly meetings. They will determine classification of all identified problems and notify the RPCCDS Program Manager of requirements to develop correction plans.

5.1.2 Problem Categories

The documented problems will be categorized as:

- **Critical** - does not meet the demonstration criteria (Part II, Section 2.3)

- **Non-critical** - problem meets the demonstration criteria, but the demonstration oversight group judges the problem sufficient to require future repair.

- **Watch Item** - item requiring further observation.

The group will meet after the demonstration to discuss and summarize the demonstration findings and make a recommendation whether the RPCCDS should be activated to replace the NIDS.

5.2 Participation

Demonstration participants will include: the NCEP; the NWSTG; at least one of the NIDS providers; and at least one non-Government user, if available. Attachment 2 will be updated with additional information about the participants as it becomes available.

5.3 Assumptions and Limitations

The following are assumptions and limitations for the demonstration.

1. Prior to commencement of the demonstration, at least one participant for each of the three product delivery options (Section 4.1) must have equipment, communication lines of sufficient capacity, and software installed, configured, and functioning properly.

2. Prior to commencement of the demonstration, all system testing must be complete and indicate no critical failures.

3. Requested log files from AWIPS, the NWSTG FTP server, and NCEP must be available along with a method for their timely transmission to the demonstration team (Part II, Section 3).

4. All NIDS radar products (Attachment 3) must be transmitted from all AWIPS sites across the WAN to the NCF. (Software patches to AWIPS are required.)

5. Long-term reliability of the system cannot be assured by a 30-day demonstration, but the initial timeliness and reliability indicators will be established.

5.4 NWSEO

This demonstration requires no actions from any NWS field site other than remote access to their communications log files and cooperation to ascertain the time it takes radar products to move from the WSR-88D RPG to the AWIPS WAN. All activities will occur at the NWS Headquarters. A copy of this plan will be forwarded to the head of the NWS Employees Organization (NWSEO).

PART II: Demonstration Methodology

1. Introduction

The primary objective of the demonstration is to measure the *timeliness* and *reliability* of the RPCCDS in delivering WSR-88D products to the demonstration participants. Measurements will be made for all three methods of product delivery described in Part I, Section 4.1. Analysis of the measurements will yield summary information for use by NWS management in deciding whether to certify the RPCCDS's readiness to meet NWS operational requirements and replace the NIDS.

Demonstration participants will also be asked to provide subjective written feedback on (a) the performance of the RPCCDS in meeting their needs for timely and reliable delivery of WSR-88D products and (b) the adequacy of technical documentation provided by the NWS. This information will also be used to support the certification decision.

2. Demonstration Approach and Success Criteria

The following sections describe the approach taken in obtaining and analyzing measurements of timeliness and reliability.

2.1 Timeliness

Timeliness will be measured and reported for a 30-day period, 24 hours per day, 7 days per week. Figure 2, RPCCDS Data Collection Points, shows the points where log files of the radar products can be acquired and the transmission time calculated. The letters in the circles indicate the points where these log files will be acquired. Table 1 defines the points on the diagram.

2.1.1 Definitions and Terms

AWIPS transmission time is the time, to the second, the product is transmitted by the local AWIPS to the WAN [Figure 2, Point B].

RPG adjustment is the elapsed time, in seconds, between (1) the time the product is transmitted by the WSR-88D RPG [Figure 2, Point A] to the associated AWIPS and (2) the **AWIPS transmission time** [Figure 2, B-A]. Since the connection to AWIPS is different for NWS, DOD, and FAA radars, there may be three different RPG adjustments corresponding to these connections. The RPG adjustment(s) will be determined through preliminary testing and applied as a fixed constant(s) in the calculation of product delivery times for the corresponding radar types. NOTE: This adjustment is necessary because the RPG system clock is unsynchronized; therefore, the time stamp on each product from the RPG is not representative and can not be used as a reference.

Radar Product Central Collection/ Distribution Service

Data Collection Points

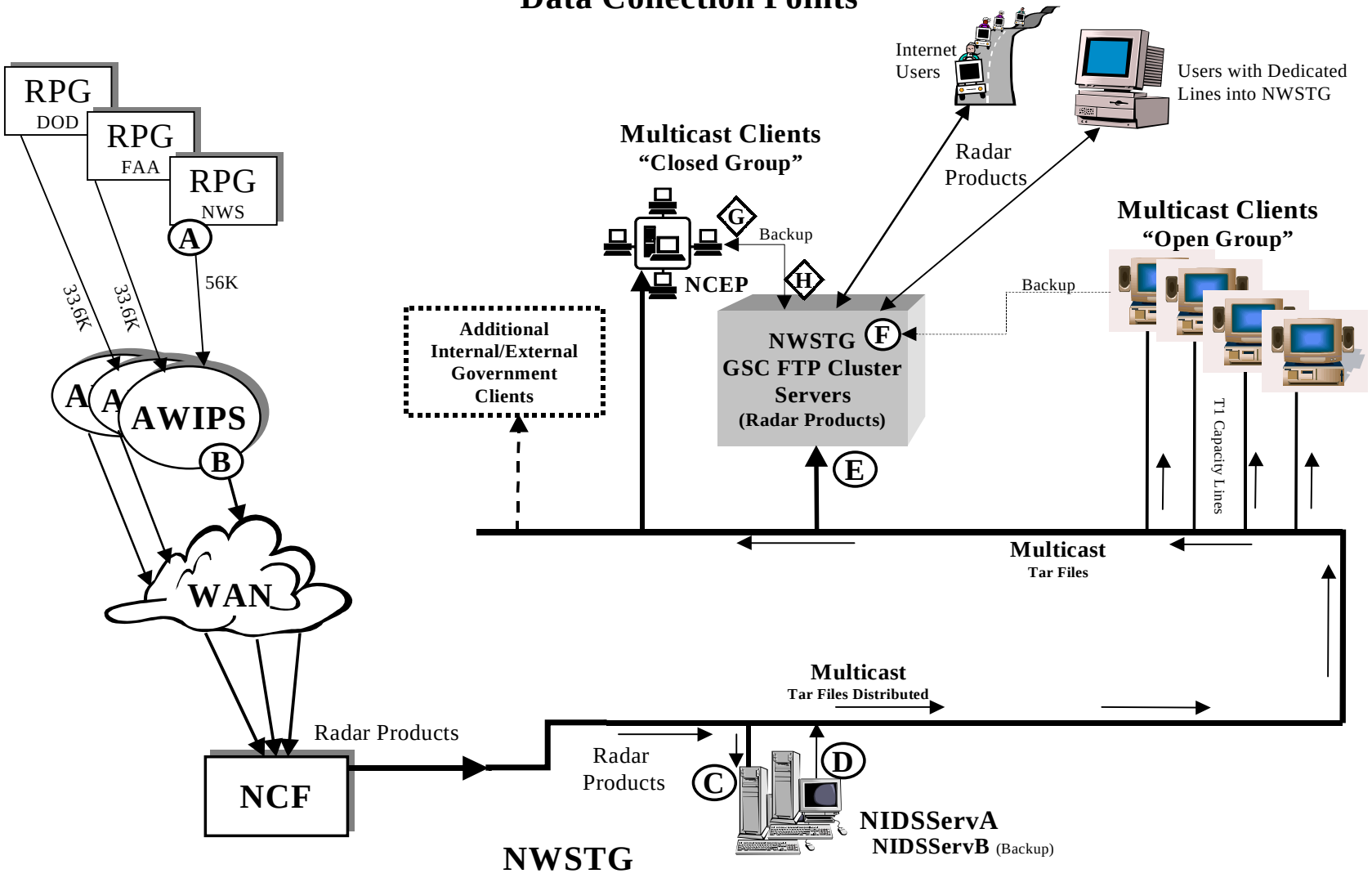

Figure 2. RPCCDS Data Collection Points

Server transmission time is the time, to the second, the product is transmitted to the participant's dedicated telephone line by the RPCCDS. [Figure 2, Point D]

FTP receipt time is the time, to the second, the product is received and made available by the GSC FTP Cluster Servers for FTP access [Figure 2, Point F].

For the Multicast delivery methods, *timeliness* is expressed in terms of the **multicast product delivery time**, determined as follows:

Multicast product delivery time =

RPG adjustment + (Server transmission time - AWIPS transmission time)
[Figure 2: D - A, calculated as (B - A) + (D - B)]

For the dedicated FTP method, *timeliness* is expressed in terms of the **FTP product delivery time**, determined as follows:

FTP product delivery time =

RPG adjustment + (FTP receipt time - AWIPS transmission time)
[Figure 2: F - A, calculated as (B - A) + (F - B)]

Table 1. Data Collection Points Identified in Figure 2

Log Point	Data Collection Points Identified in Figure 2
A	Time Radar Products Leave RPG
B	Time Radar Products Leave AWIPS Site
C	Time Radar Products Arrive at NIDSServA or B
D	Time Tar File Leaves NIDSServA or B
E	Time Tar File Arrives at GSC FTP Cluster
F	Time Radar Products are Available in GSC FTP Cluster Database
These data points do not address pass/fail criteria:	
G	Time FTP request from NCEP
H	Time FTP requested radar product received

2.1.2 Approach

For each participant, timeliness measurements will be analyzed to yield the following summary information:

- The percentage of all products transmitted by all radars (NWS, DOD, FAA) with delivery times equal to or less than 60 seconds;

- The average delivery time along with appropriate standard of deviation statistics;

- Appropriate trend information, as required.

Where appropriate, the above items will also be derived from a combined analysis of all measurements taken from all participants.

2.2 Reliability

Reliability will be measured and reported for a 30-day period, 24 hours per day, 7 days per week.

For the Multicast methods, reliability will be measured by comparing the number of products transmitted by all radars (NWS, DOD, FAA) to the RPCCDS with the number of products transmitted by the RPCCDS to the participants' dedicated lines.

For the dedicated FTP method, reliability will be measured by comparing the number of products transmitted by all radars (NWS, DOD, FAA) to the RPCCDS with the number of products received by the NWSTG's FTP server.

For each participant, reliability measurements will be analyzed to yield the following summary information:

- For the Multicast methods, the total number of products transmitted to the participants' dedicated line by the RPCCDS [Figure 2: Point D], expressed as a percentage of the total number of products transmitted to the RPCCDS by all radars [Figure 2: Point A];

- For the dedicated FTP method, the total number of products stored by the NWSTG's FTP server [Figure 2: Point F], expressed as a percentage of the total number of products transmitted to the RPCCDS by all radars [Figure 2: Point A];

- For the dedicated FTP method, appropriate information about products stored in the NWSTG's server but not received by the participants in response to an FTP request [Figure 2: Point H versus G];

- Appropriate trend information, as required.

Where appropriate, the above items will also be derived from a combined analysis of all measurements taken from all participants.

2.3 Success Criteria

The success or failure of this demonstration will be based exclusively on the analyses of data collected during the demonstration and analyzed in accordance with the methodology specified in this plan.

For this demonstration to be successful, *all* of the following criteria must be met:

2.3.1 Timeliness

T1: **No fewer than 95% of all *multicast product delivery times* (as defined in Section 2.1.1) must be 60 seconds or less** [Figure 2: D - A]**.**

T2: **No fewer than 95% of all *FTP product delivery times* to the FTP cluster servers (as defined in Section 2.1.1) must be 60 seconds or less** [Figure 2: F - A]**.**

2.3.2 Reliability

R1: **For the *multicast methods*, no fewer than 95% of the products from NWS, DOD, and FAA radars must be successfully transmitted by the RPCCDS to the demonstration participants' dedicated communication lines** [Figure 2: D / A]**.**

R2: **For the *dedicated FTP method,* no fewer than 95% of the products from NWS, DOD, and FAA radars must be successfully received by the NWSTG's FTP server and be available for FTP request.** [Figure 2: F / A]

3. Methodology

NWS measurements of RPCCDS timeliness and reliability will be made for a period of 30 consecutive days, 24 hours per day, 7 days per week.

3.1 Multicast Closed and Open Group Methods

3.1.1 Desired Participant Actions

- Provide input for measurements of RPCCDS timeliness and reliability for a minimum of three continuous hours per day, Monday through Friday, and up to 24 hours per day, 7 days per week, depending on workload constraints and the availability of automated data logging techniques. Participants should strive to schedule measurement periods to cover a wide variety of meteorological and operational conditions.

- At least once each day, ensure radar product receiver system clocks are synchronized with the National Institute of Standards and Technology (NIST) Universal Coordinated Time (UTC). Report any synchronization problems.

- For every product received, log product data in accordance with the guidance and format provided in Attachment 1, PAMS Data Format for Radar Products. Log the data in ASCII text on successive lines of a computer file (no empty lines).

- Generate a separate log file for each calendar day. The **filename** should appear in the first printable line of the file and comply with the following format:

  pppMMDD.txt, where:

  ```
  ppp = participant identification (3 alphanumeric characters)
   MM = month (2 numeric characters, e.g., July = 07)
   DD = calendar date (2 numeric characters, e.g., 1=01)
  ```

- Within 24 hours after the end of each calendar day, the log file for that day should be electronically transmitted to NWS Headquarters using one of the following methods:

  - Preferred method: FTP the file to IP address 140.90.32.103 with **username = pams** and **password = xe15utc**. Both username and password are case-sensitive;

  - Secondary method: Attach the file to an e-mail message and send the message to **khien.nguyen@noaa.gov**.

- Demonstration participants should provide subjective evaluations of RPCCDS timeliness and reliability, as well as system documentation.

3.1.2 NWS Actions

- Determine representative **RPG adjustment(s)** for NWS, DOD, and FAA radars (see Part II, Section 2.1.1).

- For each participant:

  - Use the PAMS to collect appropriate product data from (1) the WAN transmission logs at all AWIPS sites that transmit radar products and (2) the RPCCDS logs for 30 days, 24 hours per day, 7 days per week;

  - Merge data collected by the PAMS with data from participant logs into a spreadsheet;

  - Use the spreadsheet to analyze the merged data and support the development of summary information as outlined in Section 2.1.2, Approach.

3.2 Dedicated FTP Method

3.2.1 Desired Participant Actions

- At least once each day, ensure FTP and product receiving devices are time synchronized with the NIST UTC. Report any synchronization problems.

- For every product received in response to an FTP request:

- log product receipt data in accordance with the guidance and format provided in Attachment 1;

- after the last item of product receipt data is logged, enter a space followed by the date and time (UTC) of the *FTP request* in the format **DDhhmmss, where:**

  DD = day of the month
  hh = hour
  mm = minute
  ss = second

- Log the above data in ASCII text on successive lines of a computer file (no empty lines).

- In the same file, following the last line of formatted data, enter a line feed and then list (in free form) any product requested by FTP but *not* received. At a minimum, provide the following information:

  - product identifier/WMO header, if known;

  - date and time (**DDhhmmss**) the FTP request was submitted;

  - any other information that might be helpful in troubleshooting.

- Generate a separate log file for each calendar day in which FTP requests are submitted. The **filename** should appear in the first printable line of the file and comply with the following format:

  pppMMDD.txt, where:

  ppp = participant identification (3 alphanumeric characters)
  MM = month (2 numeric characters, e.g., July = 07)
  DD = calendar date (2 numeric characters)

- Within 24 hours after the end of a calendar day in which FTP requests were made, the log file for that day should be electronically transmitted to NWS Headquarters using one of the following methods:

  - Preferred method: FTP the file to IP address 140.90.32.103 with **username = pams** and **password = xe15utc**. Both username and password are case-sensitive;

  - Secondary method: Attach the file to an e-mail message and send the message to **khien.nguyen@noaa.gov**.

3.2.2 NWS Actions

For each participant:

- Use the PAMS to collect appropriate radar product data from (1) the WAN transmission logs at all AWIPS sites that transmit radar products and (2) the RPCCDS logs (to include the NWSTG FTP server logs) for 30 days, 24 hours per day, 7 days per week;

- Merge data collected by the PAMS with data from participant logs into a spreadsheet;

- Use the spreadsheet to analyze the merged data and support the development of summary information as outlined in Section 2.1.2, Approach.

PART III: Demonstration Reporting

1. Introduction

This section describes how the demonstration data analyses and reporting will be accomplished.

2. Reports

Demonstration Team staff and participants will immediately bring RPCCDS performance problems to the attention of the Demonstration Director and the RPCCDS Program Manager. The Demonstration Director will coordinate all problems for resolution immediately by e-mail with the RPCCDS Demonstration Oversight Group (Attachment 2) to document the issues and the impacts on RPCCDS users. Any problems deemed critical will constitute a failure. A preliminary report will be issued by e-mail to the program manager within two weeks of the end of the data collection period.

The Demonstration Team will provide the Demonstration Director and RPCCDS Program Manager with weekly summary status reports. The RPCCDS demonstration report containing demonstration details will be coordinated and distributed within 60 days after the end of the demonstration.

3. Data Analysis

FSB demonstration staff will collect and analyze data as described in PART II, Section 3: Methodology. Data analyses will be accomplished at WSH. The analyses will be used to support summary information about the timeliness and reliability of RPCCDS performance.

4. Briefings

Briefings will be provided to NWS management every 2 weeks.

Attachment 1

PAMS DATA FORMAT FOR RADAR PRODUCTS

Khien B. Nguyen
Phone (301)-713-0326 x113, Email khien.nguyen@NOAA.gov

1.	**WMO Header**	**Alphanumeric**	**10 Characters**	
2.	Field Separator	Blank	1 Character	
3.	**Time of Reception Begin**	**MMDDYY hh mm ss**	**15 Characters**	
4.	Field Separator	Blank	1 Character	
5.	**Time of Reception End**	**MMDDYY hh mm ss**	**15 Characters**	
6.	Field Separator	Blank	1 Character	
7.	**PID**	**Alphanumeric**	**1-15 Characters**	(Filled with 000 when N/A)
8.	Field Separator	Blank	1 Character	
9.	**Byte Size**	**Numeric**	**1-10 Characters**	(Filled with 000 when N/A)
10.	Field Separator	Blank	1 Character	
11.	**WMO Time**	**DDhhmm**	**6 Characters**	(Filled with 999999 when N/A)
12.	Field Separator	Blank	1 Character	
13.	**Data Node**	**Alphanumeric**	**1-15 Characters**	(Filled with XXX when N/A)
14.	Field Separator	Blank	1 Character	
15.	**Data Source**	**Alphanumeric**	**1-15 Characters**	(Filled with XXX when N/A)
16.	Field Separator	Blank	1 Character	
17.	**Data Destination**	**Alphanumeric**	**1-15 Characters**	(Filled with XXX when N/A)
18.	Field Separator	Blank	1 Character	
19.	**Miscellaneous**	**Alphanumeric**	**0-130 Characters**	

Notes:

1. Each record contains a maximum of 255 characters (including blanks) long.
2. Field No. 5 (Time of Reception End) : If this is not available then make it the same as Field No.3.
3. Field No. 7 (PID) product identifier number (available on the AWIPS communications header).
4. Field No. 9 (Byte Size) the number of bytes in the product.
5. Field No. 11 (WMO Time) the day, hour, minute time in the WMO header
6. Field No. 13 (Data Node) indicates where a particular log was obtained from (such as NCF Receive, NCF Transmit, etc.)
7. Field No. 15 (Data Source) indicates origin of a particular product.
8. Field No. 17 (Data Destination) indicates the destination of a particular product.
9. Field No. 19 (Misc.) contains first 10 characters of the second line of the log.

EXAMPLE OF LOG RECEIVED AT NWSTG ON 04/17/00

Field	1	3	5	7	9	11	13	15	17	19

SDUS45KILM 041700 00 00 09 041700 00 00 09 ANCF-224 397 162359 NWSTG ILM NWSTG RCMLTX
SDUS43KBIS 041700 00 00 41 041700 00 00 41 ANCF-330 590 170000 NWSTG BIS NWSTG RCMBIS

Attachment 2

RPCCDS Demonstration Oversight Group		
NWS HEADQUARTERS		
TITLE	**NAME/OFFICE SYMBOL**	**TELEPHONE**
Demonstration Director	**Jerald Dinges (OSO13)**	**301-713-0326 x176** **FAX: 301-713-0912**
Demonstration Team Staff	**Mary Buckingham (Team Lead, OSO13)** **Ken Bashford (OSO13)** **Khien Nguyen (PAMS, OSO13)**	**301-713-0326 x123** **301-713-0326 x102** **301-713-0326 x113**
RPCCDS Program Management Staff	**Vico Baer (Program Manager, OSO1x1)** **Mike Carelli (OSO14)** **Ronald Smith (OSO1x1)**	**301-713-0070 x157** **301-713-1724 x184** **301-713-0070 x162**
Office of Meteorology Focal Point	**Robin Radlein (OM22)**	**301-713-1867 x121**
NWSTG Focal Point	**Allan Darling (OSO24)**	**301-713-0882 x114**
AWIPS Program Office Focal Point	**Charles Piercy (APO)**	**301-713-1570 x127**
RPCCDS Development Focal Points	**Nolan Miller (APO)** **Dave Alden (Contractor, GMSI)**	**301-713-1975 x101** **301-214-8120**
DEMONSTRATION PARTICIPANTS		
ORGANIZATION	**FOCAL POINT**	**TELEPHONE**
Multicast "Closed Group" Clients		
NCEP	**H. Jerry Kelly** **Paula Freeman**	**301-763-8000 x7134** **301-763-8000 x7156**
Multicast "Open Group" Clients		
To be determined		
Dedicated FTP Clients		
NCEP		

Attachment 3

The National default lists for AWIPS transmission of radar products is below. Products denoted with (**) are required in precipitation mode only. Products denoted with (✓) are current NIDS products.

NIDS Radar Products		
	Precip Mode	**Product**
1	✓	.54 nm resolution base Reflectivity 0.5° elevation
2	✓	.54 nm resolution base Reflectivity 1.5° elevation
3	✓	.54 nm resolution base Reflectivity 2.5° elevation
4	✓	.54 nm resolution base Reflectivity 3.5° elevation
5	✓	1.1 nm resolution base Reflectivity 0.5° elevation
6		.13 nm resolution base Velocity 0.5° elevation
7	✓	.54 nm resolution base Velocity 0.5° elevation
8	✓	.54 nm resolution base Velocity 1.5° elevation
9	✓	.54 nm resolution base Velocity 2.5° elevation
10	✓	.54 nm resolution base Velocity 3.5° elevation
11		.13 nm resolution base Spectrum Width 0.5° elevation
12		.54 nm resolution base Spectrum Width 0.5° elevation
13	**✓	.54 nm resolution Storm Relative Velocity 0.5° elevation
14	**✓	.54 nm resolution Storm Relative Velocity 1.5° elevation
15	**	.54 nm resolution Storm Relative Velocity 2.5° elevation
16	**	.54 nm resolution Storm Relative Velocity 3.5° elevation
17		.54 nm resolution Composite Reflectivity (16 data level)
18	✓	2.2 nm resolution Composite Reflectivity (16 data level)
19	✓	2.2 nm resolution Composite Reflectivity (8 data level){in clear air mode only}

NIDS Radar Products		
	Precip Mode	**Product**
20	✓	Layer Composite Reflectivity Maximum Low Level
21	**✓	Layer Composite Reflectivity Maximum Mid Level
22	**✓	Layer Composite Reflectivity Maximum High Level
23	✓	Layer Composite Reflectivity Maximum AP removed
24	**✓	Echo Tops
25	**	Severe Weather Probability
26	**✓	Vertically Integrated Liquid (VIL)
27	**	Storm Track Information
28	**	Hail Index
29	**	Mesocyclone
30	**	Tornadic Vortex Signature
31	**	Storm Structure
32	**✓	One Hour Precipitation
33	**✓	Three Hour Precipitation
34	**✓	Storm Total Precipitation
35	✓	VAD Wind Profile

Text Products (available when generated)	
Identifier	**Description**
RCM	Radar Coded Message
FTM ✓	Free Text Message
DPA ✓	Digital Precipitation Array

NOTE: For all DOD and FAA radars currently connected at 14.4 kilobits per second (Kbps), a reduced number of products will be collected which may not include the full NIDS product set. Later this summer when these connections are upgraded to 33.6 Kbps, at a minimum, the full NIDS product set will be collected.

Addendum to the Operations Demonstration Plan for the Radar Product Central Collection/Distribution Service (RPCCDS)

After the above plan was distributed, a change in policy was made for the National Weather Service (NWS) radar product lists generated at NWS Weather Forecast Offices (WFO). To accommodate the differing operational needs of WFOs, each office may adjust the radar products included in their routine product set (RPS) sent to their Advanced Weather Interactive Processing System (AWIPS). The default RPS is identified in attachment 3 in the plan. Attachment 3 includes products needed for the radar archive level III function in addition to the NEXRAD Information Dissemination Service (NIDS) products indicated by a checkmark (✓) in the second column).

The NWS WFOs are required to retain the NIDS product set in their RPS lists for NWS radars and these products will be delivered to the RPCCDS. The non-NIDS products will be generated at each site's discretion. If a product in attachment 3 is generated, it will be delivered to the RPCCDS. No products other than those on the list in attachment 3 will be transmitted to the RPCCDS, if generated.

The NIDS products will be sent by the sites to the RPCCDS as long as the individual radars are functioning properly. The only exception, as noted in the plan, is sites still connected to Federal Aviation Administration (FAA) or Department of Defense (DOD) radars at 14.4 kilobits per second (Kbps) may not generate the full NIDS product set for those radars during the demonstration. The NWS is currently upgrading these connections to 33.6Kbps to accommodate a greater number of products. The upgraded modems will not all be in place prior to commencement of the demonstration, but will be in place prior to the termination of the NIDS agreements. Once each DOD/FAA connection is upgraded the full NIDS product set, at a minimum, will be generated and available in the RPCCDS.

The changes noted above do not affect the plan for the demonstration of the RPCCDS. The demonstration intends to verify timeliness and reliability for the NIDS products only.

Attachment 3

The National default lists for AWIPS transmission of radar products is below. Products denoted with (**) are required in precipitation mode only. Products denoted with (✓) are current NIDS products.

NIDS Radar Products		
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2	✓	.54 nm resolution base Reflectivity 1.5º elevation
3	✓	.54 nm resolution base Reflectivity 2.5º elevation
4	✓	.54 nm resolution base Reflectivity 3.5º elevation
5	✓	1.1 nm resolution base Reflectivity 0.5º elevation
6		.13 nm resolution base Velocity 0.5º elevation
7	✓	.54 nm resolution base Velocity 0.5º elevation
8	✓	.54 nm resolution base Velocity 1.5º elevation
9	✓	.54 nm resolution base Velocity 2.5º elevation
10	✓	.54 nm resolution base Velocity 3.5º elevation
11		.13 nm resolution base Spectrum Width 0.5º elevation
12		.54 nm resolution base Spectrum Width 0.5º elevation
13	**✓	.54 nm resolution Storm Relative Velocity 0.5º elevation
14	**✓	.54 nm resolution Storm Relative Velocity 1.5º elevation
15	**	.54 nm resolution Storm Relative Velocity 2.5º elevation
16	**	.54 nm resolution Storm Relative Velocity 3.5º elevation
17		.54 nm resolution Composite Reflectivity (16 data level)
18	✓	2.2 nm resolution Composite Reflectivity (16 data level)
19	✓	2.2 nm resolution Composite Reflectivity (8 data level){in clear air mode only}

NIDS Radar Products		
	Precip Mode	**Product**
20	✓	Layer Composite Reflectivity Maximum Low Level
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22	**✓	Layer Composite Reflectivity Maximum High Level
23	✓	Layer Composite Reflectivity Maximum AP removed
24	**✓	Echo Tops
25	**	Severe Weather Probability
26	**✓	Vertically Integrated Liquid (VIL)
27	**	Storm Track Information
28	**	Hail Index
29	**	Mesocyclone
30	**	Tornadic Vortex Signature
31	**	Storm Structure
32	**✓	One Hour Precipitation
33	**✓	Three Hour Precipitation
34	**✓	Storm Total Precipitation
35	✓	VAD Wind Profile

Text Products (available when generated)		
Identifier		**Description**
RCM		Radar Coded Message
FTM	✓	Free Text Message
DPA	✓	Digital Precipitation Array

NOTE: For all DOD and FAA radars currently connected at 14.4 kilobits per second (Kbps), a reduced number of products will be collected which may not include the full NIDS product set. Later this summer when these connections are upgraded to 33.6 Kbps, at a minimum, the full NIDS product set will be collected.